

## META-ANALYSIS: THE EFFECT OF TEACHING MEDIA TOWARDS STUDENTS' ENGLISH VOCABULARY MASTERY

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### Abstract:

This study conducts a meta-analysis to evaluate how different teaching media affect students' English vocabulary mastery. This research uses a quantitative method by conducting meta-analysis to review 20 quantitative experimental articles published between 2018 and 2024. The research aims to give a detailed understanding of the impact of various media on vocabulary learning. The study finds that interactive and engaging media, such as games, songs, and applications like Duolingo and "My Dictionary," significantly improve vocabulary mastery. The Guessing Game shows the highest impact with an effect size of 0.893, indicating a huge effect, while the Mesmerize Application has the least impact with an effect size of 0.005. The results show that elementary and junior high school students benefit the most from these media, with the highest effect sizes at these educational levels. The findings support the use of innovative teaching media in English language education, emphasizing student-centered learning and the use of technology to enhance educational outcomes. This research provides important insights for educators, curriculum developers, and policymakers looking to improve English vocabulary teaching strategies. It advocates for the strategic use of engaging teaching methods and technology to support vocabulary mastery, which is crucial for effective communication skills in English.

### Keywords:

Meta-Analysis;  
Teaching Media;  
Vocabulary



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## INTRODUCTION

In this digital era, media has become an essential part of daily life, especially in the field of education. The development of information and communication technology has provided wide access to various types of media, from print, electronic, to social media. The use of social media has been proven to offer multiple benefits in the learning process, one of which is in students' vocabulary mastery. Vocabulary itself is one of the main components in mastering the English language. A rich and diverse vocabulary can enhance students' verbal and non-verbal communication skills. Therefore, effective methods and strategies are needed in teaching. Media, as an easily accessible and engaging tool, offers great potential to help students enrich their vocabulary.

Particularly for EFL, a strong vocabulary allows them to express their thoughts clearly and understand complex texts, which is essential for effective learning across all subjects. Furthermore, a rich vocabulary fosters critical thinking and encourages students to engage more deeply with the material, making connections and drawing inferences that enhance their educational experience. Additionally, vocabulary development is linked to improved writing skills, as students with a broader word bank can articulate their ideas more effectively in essays and reports. Vocabulary learning is not just a component of language learning but a foundational element that supports overall language proficiency (Agazzi, 2022).

Learning skills refer to the abilities and strategies that individuals use to acquire, process, and apply knowledge effectively. On the other hand, teaching media refers to the extensive range of tools and resources utilized to facilitate this educational journey. These elements create a dynamic educational environment that supports knowledge acquisition and encourages learners to think critically and creatively. Duolingo is a widely recognized application for language learning, particularly English, and is an effective teaching media. It facilitates independent learning by allowing students to study English outside the traditional classroom environment, thus promoting self-directed education. The application is meticulously crafted to be both stimulating and enjoyable, thereby considerably enhancing learners' motivation (Kemala Sari et al., 2022).

The low learning outcomes in English among Indonesian students are complex issues influenced by various factors, including insufficient vocabulary acquisition. According to recent data from the EF English Proficiency Index (EF EPI) 2023, Indonesia ranks 79th out of 113 countries with an average score of 469, indicating relatively weak proficiency in the language. This reflects the challenges faced by students in mastering this foreign tongue. Many students struggle with learning English due to their limited vocabulary base. In other words, Indonesian students have insufficient English vocabulary collection (Sudarman et al., 2022). Research indicates that learners face difficulties in memorizing and utilizing new words, which constitutes basic skills for effective communication. These limitations hinder their abilities to listen, speak, read, and write proficiently.

Based on *kurikulum merdeka* students are expected to achieve six key elements in English learning: listening, reading, viewing, speaking, writing, and presenting. On the other hand, in the 2013 Curriculum, students are required to meet several competencies, such as understanding and practicing their religious teachings (KI 1), developing behaviors like honesty, discipline, responsibility, and cooperation in social interactions, reflecting the nation's values in the global community (KI 2), applying factual, conceptual, and procedural knowledge in various fields like science, technology, arts, and culture (KI 3), and processing, analyzing, and presenting information in both concrete and abstract contexts using appropriate scientific methods (KI 4). Looking at the learning outcomes from both curriculums, the writer is interested in exploring whether students' English skills have reached the expected learning goals. In order to support the improvement of vocabulary mastery in English learning, teachers are encouraged to employ interactive teaching media to boost students' interest and make their understanding of vocabulary more relevant. This approach can lead to a significant improvement in students' English vocabulary mastery.

Previous studies have shown that media use successfully affects students' English vocabulary mastery (Raudlatul H., et al 2022). However, these studies have produced varied positive results, ranging from small to large (Robi., et al., 2022). Therefore, a meta-analysis is needed to unify these study results and provide a more comprehensive picture of the influence of media on students' English vocabulary acquisition.

This meta-analysis aims to critically analyze and evaluate various studies related to the use of educational media on students' English vocabulary mastery. This study aligns with the principles of the Independent Curriculum (*Kurikulum Merdeka*) by prioritizing student-centered learning, cultivating critical thinking and problem-solving abilities, and promoting the use of technology to enhance teaching and learning. By examining the impact of instructional media, this research contributes to the broader goal of improving English language education in Indonesia and equipping students with the necessary skills of English.

Based on this, the research problems of this meta-analysis are formulated as follows; (1) How much is the effect size of teaching media on English vocabulary mastery based on independent variables?, (2) How much is the effect size of educational media on English vocabulary mastery based on educational level?, (3) How much is the effect size of educational media on English vocabulary mastery based on the publication year?, (4) How much is the effect size of teaching media on English vocabulary mastery based on the region?, and (5) How much is the cumulative effect size of educational media on English vocabulary mastery used as learning content?

## **METHOD**

The writers adopted a meta-analysis methodology to determine the effectiveness of learning media in improving English vocabulary mastery among students. By systematically analyzing findings from relevant research published in various sources, including Google Scholar and Sci-Space, this study aims to draw comprehensive conclusions regarding the impact of various learning media on students' vocabulary acquisition. Articles were retrieved from Google Scholar and Sci-Space using the search terms “the effect of teaching media” and “English vocabulary mastery”.

In order to ensure the relevance and validity of the meta-analysis, a Purposive Sampling approach was utilized to carefully select articles that align with the specific research focus. This involved identifying and extracting data from a subset of articles that met the established criteria, ensuring that the analysis was based on a representative sample of relevant studies.

In quantifying the strength of the relationships between variables, the writers apply the Healy formula (Healy, 1984) for calculating effect size. This formula, rooted in the principles of analysis of variance (ANOVA) and regression analysis, expresses effect size as  $r^2 = \frac{to^2}{to^2+db}$ . In this context,  $r^2$  represents the proportion of the dependent variable's variance that can be attributed to the independent variable(s). It serves as a specific case of the general  $r^2$  measure. The formula incorporates  $to^2$ , representing the explained variance (sum of squares due to regression), and  $db$ , representing the unexplained variance (sum of squares due to error).

Based on the provided criteria, the interpretation of effect size is as follows:

- Small Effect:  $0.01 < r^2 < 0,09$
- Medium Effect:  $0,09 < r^2 < 0,25$
- Large Effect:  $r^2 > 0,25$

## RESULTS AND DISCUSSION

### Results

A comprehensive collection of 20 articles examining the effect of teaching media towards students' English vocabulary acquisition among students was assembled for this meta-analysis. These articles were carefully selected from a diverse range of academic journals and conference proceedings published between 2018 and 2024. Table 1 provides a detailed breakdown of the 20 articles across various research groups.

**Table 1.** Sample Article Distribution

No.	Title	Author/Institution	Journal Name	Link
1	The implementation of Audio-Visual Media in improving students' vocabulary mastery through WhatsApp	Adelia Puspita, Cucu Sutarsyah, Burhanuddin Universitas Lampung	U-Jet: UNILA Journal of English Teaching	<a href="https://doi.org/10.22450/55661-1-PB-libre.pdf">22450-55661-1-PB-libre.pdf</a>
2	Pengaruh Media Film Barat dengan Subtitle Bahasa Inggris terhadap Penguasaan Kosakata Siswa	Siti Nurrahmah, Romdanih, Megawati STKIP Kusuma Negara	SEMNARA 2021	<a href="https://jurnal.stkipkusumanegara.ac.id/index.php/semnara2020/article/view/376">https://jurnal.stkipkusumanegara.ac.id/index.php/semnara2020/article/view/376</a>
3	Pengaruh Media Film Barat dengan Subtitle Bahasa Inggris terhadap Penguasaan Kosa Kata Siswa dengan Menggunakan Sistem Belajar Dari Rumah SMP Negeri 3 Kapontori	Maulana Idris Hari Kismoko, Mulyadi Rusman Roni SMA PGRI Gelumbang, Universitas PGRI Palembang	Prosiding Seminar Nasional Program Pascasarjana Universitas PGRI Palembang	<a href="https://jurnal.univpgripalembang.ac.id/index.php/Prosidingpps/article/view/5626">https://jurnal.univpgripalembang.ac.id/index.php/Prosidingpps/article/view/5626</a>
4	The Effect of Guessing Game on Students' Vocabulary Knowledge (A Quasi-experimental Study at the Seventh Grade of a state Islamic Junior High School of Tangerang Selatan)	Raudlatul Hasanah, Ismalianing Eviyuliwati, Maya Deviyanti UIN Syarif Hidayatullah	Sibatik Journal: Jurnal Ilmiah Bidang Sosial, Ekonomi, Budaya, Teknologi, dan Pendidikan	<a href="https://publish.ojs-indonesia.com/index.php/SIBATIK/article/view/12">https://publish.ojs-indonesia.com/index.php/SIBATIK/article/view/12</a>
5	The Use of Think Bingo Game to Improve Students' Vocabulary Mastery	Rita Noviyanti, Syamsul Bahri, and Chairina Universitas Syiah Kuala	Research in English and Education Journal	<a href="https://jim.usk.ac.id/READ/article/view/11466">https://jim.usk.ac.id/READ/article/view/11466</a>
6	Using Jumbled Letters to Improve Students Vocabulary Mastery	Sri Wahyuni, Ali Wira Rahman Universitas Muhammadiyah Parepare	KLASIKAL: Journal of Education, Language Teaching and Science	<a href="http://www.journalfkipuniversitasbosowa.org/index.php/klasikal/article/view/35">http://www.journalfkipuniversitasbosowa.org/index.php/klasikal/article/view/35</a>
7	Using Song to Improve Vocabulary Mastery for Elementary School	Amelia Ramadini, Siti Halimah IKIP Siliwangi	PROJECT: Professional Journal of English Education	<a href="https://journal.ikipsiliwangi.ac.id/index.php/project/article/view/1731">https://journal.ikipsiliwangi.ac.id/index.php/project/article/view/1731</a>
8	The Use of My Dictionary Application to Improve Students, Vocabulary Mastery	Iman Santosa, Andriyadi IKIP SILIWANGI	Eltin Journal: Journal of English Language Teaching in Indonesia	<a href="http://e-journal.stkipsiliwangi.ac.id/index.php/eltin/article/view/1224">http://e-journal.stkipsiliwangi.ac.id/index.php/eltin/article/view/1224</a>
9	The Influence of Subtitled Movies on Students Vocabulary Mastery	Abu Bakar, Sayid Ma'rifatullah Universitas Hasyim Asy'ari	LENCANA: Jurnal Inovasi Ilmu Pendidikan	<a href="https://ejournal.politeknipratama.ac.id/index.php/Lencana/article/view/2387">https://ejournal.politeknipratama.ac.id/index.php/Lencana/article/view/2387</a>

10	The Use of Modified English Song to Improve Vocabulary	Nuzulur Rohmah, Rohmani Nur Indah  IAIN Kediri, Universitas Islam Negeri Maulana Malik Ibrahim Malang	Eltin Journal: Journal of English Language Teaching in Indonesia	<a href="http://www.e-journal.stkipsiliwangi.ac.id/index.php/eltin/article/view/2537">http://www.e-journal.stkipsiliwangi.ac.id/index.php/eltin/article/view/2537</a>
11	The Use of English Subtitle in Movie to Improve Students' Vocabulary: An Experimental Study in Grade IX of SMPN 1 Gunung Sari Academic Year 2015/2016	Rosmia Citra Lestari  Universitas Mataram	AJES - Academic Journal of Education Sciences	<a href="https://ejournal.undana.ac.id/AJES/article/view/1264">https://ejournal.undana.ac.id/AJES/article/view/1264</a>
12	Pengaruh Penggunaan Duolingo untuk Meningkatkan Kosakata Siswa Kelas Tujuh	Ursya Tiara Khawas, Eliasanti Agustina  Universitas PGRI Adi Buana Surabaya	Jurnal Abdi Insani	<a href="https://abdiinsani.unram.ac.id/index.php/jurnal/article/view/1511">https://abdiinsani.unram.ac.id/index.php/jurnal/article/view/1511</a>
13	Using vocabulary notebooks to improve vocabulary mastery of seventh-grade students	Ni Luh Fitri Andewi, Mochtar Marhum, Mafulah  Universitas Tadulako	E-Journal of English Language Teaching Society	<a href="https://using-vocabulary-notebooks-to-improve-vocabulary-mastery-of-1z653fjypr">using-vocabulary-notebooks-to-improve-vocabulary-mastery-of-1z653fjypr</a>
14	Anagram Game to Enhance Students' Vocabulary Mastery	Wardah Mutiah Nasution, Yusni Sinaga.  Institut Agama Islam Negeri (IAIN) Padangsidimpuan, Indonesia	English Journal for Teaching and Learning	<a href="https://jurnal.uinsyahada.ac.id/index.php/EEJ/article/view/2685">https://jurnal.uinsyahada.ac.id/index.php/EEJ/article/view/2685</a>
15	The Effect of Using Duolingo Application Toward Students' Vocabulary Mastery at The Second Grade of SMPN 1 Koto Besar	Yesa Fitri, Melyann Melani, Veni Roza, Reflinda Reflinda  UIN Bukittinggi	Innovative: Journal Of Social Science Research	<a href="https://j-innovative.org/index.php/Innovative/article/view/1374">https://j-innovative.org/index.php/Innovative/article/view/1374</a>
16	Word Mapping in Students' Vocabulary Mastery	Siti Syafi'atul Qomariyah, Bq. Zuhrotun Nafisah.  Universitas Pendidikan Mandalika	Journal of English Language Teaching	<a href="https://e-journal.undikma.ac.id/index.php/joelt/article/view/2736">https://e-journal.undikma.ac.id/index.php/joelt/article/view/2736</a>
17	The Effect of Using Crossword in Teaching Vocabulary at The Eighth Grade of SMP HKBP Sidorame Medan	Diana Lamjunida Siregar, Nurhayati Sitorus, Febrika Dwi Lestari  Universitas HKBP Nommensen	Journal of English Language and Education JOURNAL SCIENTIA	<a href="https://infor.seaninstitute.org/index.php/pendidikan/article/view/2002">https://infor.seaninstitute.org/index.php/pendidikan/article/view/2002</a>
18	The Effect of Using "Duolingo" Application on English Vocabulary Mastery of Grade Eighth at Smp Swasta Teladan Pematangsiantar	Novra Melisa P. Hutabarat, Siska Anggita Situmeang  Universitas HKBP Nommensen PematangSiantar	Innovative: Journal Of Social Science Research	<a href="https://j-innovative.org/index.php/Innovative/article/view/2992">https://j-innovative.org/index.php/Innovative/article/view/2992</a>
19	The Effect of Memrise Application Towards Students' Vocabulary Mastery	Robi Faizal Rohim, Rizdki Elang Gumelar, Riandi Riandi  Universitas Mathla'ul Anwar	Journal of English Language Learning (JELL)	<a href="https://ejournal.unma.ac.id/index.php/jell/article/view/3656">https://ejournal.unma.ac.id/index.php/jell/article/view/3656</a>
20	The Effect of Duolingo Application on Students' English Vocabulary Mastery	Husnur Rosyidah Aulia, Eka Wahjuningsih, Rika Andayani Jember University	ELTR Journal	<a href="https://apspsi.or.id/eltr/index.php/eltr/article/view/71">https://apspsi.or.id/eltr/index.php/eltr/article/view/71</a>

### Discussion

This research examined articles in a meta-analysis and examined the number of different types of variables used (these included audiovisuals, films, games, songs, applications,

jumbled letters, crosswords, and word mapping). Table 2 provides more details about these categories.

**Table 2.** Effect Size by Independent Variable (Vocabulary Mastery)

No.	Research Related Variables	Effect Size	Number of Articles	Average Effect Size	Category
1	Audio Visual	0.490	1	0.490	Large Effect
2	Film	0.126	4	0.155	Medium Effect
		0.126			
		0.219			
		0.149			
3	Guessing Game	0.893	1	0.893	Large Effect
4	Song	0.992	2	0.547	Large Effect
		0.156			
5	Bingo Game	0.679	1	0.679	Large Effect
6	Duolingo Application	0.042	4	0.210	Medium Effect
		0.529			
		0.178			
		0.089			
7	Jumbled Letters	0.276	1	0.276	Large Effect
8	My Dictionary Application	0.985	1	0.985	Large Effect
9	Vocabulary Notebooks	0.196	1	0.196	Medium Effect
10	Anagram Game	0.168	1	0.168	Medium Effect
11	Crossword	0.537	1	0.537	Large Effect
12	Word Mapping	0.470	1	0.47	Large Effect
13	Memrise Application	0.005	1	0.005	Small Effect

As Table 2 shows, the most prevalent learning mediums employed to enhance students' English vocabulary proficiency are films and the Duolingo application. Table 2 shows that the Guessing Game greatly affects students' English vocabulary with an average effect size of 0.893. This is because the media presented is quite exciting and attracts much interest. Meanwhile, the Memrise Application has the most minor effect on students' mastery of English vocabulary, with an average effect size of 0.005.

**Table 3.** Effect Size by Education Level

No.	Educational Level	Effect Size	Number of Articles	Average Effect Size	Category
1	Elementary School	0.992	1	0.992	Large Effect
2	Junior High School/Islamic Junior High School	0.893	14	0.339	Large Effect
		0.679			
		0.985			
		0.219			
		0.156			
		0.149			
		0.042			
		0.196			
		0.168			
		0.529			
		0.470			
		0.178			
		0.001			
		0.089			
3	Senior High School/Islamic Senior High School	0.490	5	0.311	Large Effect
		0.126			
		0.126			
		0.276			
		0.537			



Table 3 shows the distribution of research on English vocabulary learning media based on education level. The level of education shows a significant influence of learning media on the mastery of English vocabulary. Data on the testing of learning media shows better results for elementary school (the largest effect category, 0.992), implementation of learning media in junior high school/Islamic junior high school shows a significant effect (0.339), and implementation in senior high school/Islamic senior high school shows a large effect (0.311).

**Table 4.** Effect Size by Publication Year

No.	Publication Year	Effect Size	Number of Articles	Average Effect Size	Category
1	2018	0.149	2	0.173	Medium Effect
2	2019	0.196	4	0.733	Large Effect
		0.679			
3	2020	0.276	4	0.214	Medium Effect
		0.992			
		0.985			
		0.126			
4	2021	0.168	3	0.258	Large Effect
		0.47			
		0.089			
5	2022	0.490	3	0.478	Large Effect
		0.126			
		0.156			
6	2023	0.893	3	0.309	Large Effect
		0.537			
		0.001			
7	2024	0.219	1	0.042	Small Effect
		0.529			
		0.178			

Table 4 shows the distribution of research on English vocabulary learning media based on the year of article publication. The years of publication 2018-2024 show varying effects. Data on the testing of learning media shows that publications in 2019 have a large effect category (0.733), and publications in 2024 have a small effect category (0.042).

**Table 5.** Effect Size by Region

No.	Region of Research	Effect Size	Number of Articles	Average Effect Size	Category
1	Jawa	0.126	9	0.406	Large Effect
		0.893			
		0.992			
		0.985			
		0.219			
		0.156			
		0.149			
		0.042			
		0.089			
2	Sulawesi	0.196	2	0.236	Medium Effect
		0.276			
3	Sumatera	0.490	7	0.387	Large Effect
		0.126			
		0.679			
		0.168			
		0.529			
	0.537				

		0.178			
4	Nusa Tenggara	0.470	1	0.470	Large Effect
5	Kalimantan	0.005	1	0.005	Small Effect

Table 5 shows the distribution of research on English vocabulary learning media based on research region. It shows that research regions have varying effects. Data on the testing of learning media shows that Nusa Tenggara has a large effect category (0.470), and the Kalimantan region has a small effect category (0.005).

**Table 6.** Cumulative Effect Size

No.	Subunit		Effect Size	Average Effect Size	Category
	Region	Related Variables			
1	Jawa	Duolingo	0.089	0.089	Small Effect
2		Duolingo	0.042	0.042	
3	Kalimantan	Memrise Application	0.005	0.005	Medium Effect
4	Jawa	Film	0.126	0.126	
5		Film	0.219	0.219	
6		Song	0.156	0.156	
7	Sulawesi	Film	0.126	0.126	Large Effect
8	Sulawesi	Vocabulary Notebooks	0.196	0.196	
9	Jawa	Film	0.149	0.149	
10	Sumatera	Duolingo	0.178	0.178	
11	Jawa	Anagram Game	0.168	0.168	
12		Guessing Games	0.893	0.893	
13		Song	0.992	0.992	
14	Sulawesi	My Dictionary Application	0.985	0.985	
15	Sumatera	Audio Visual Media	0.49	0.49	
16		Duolingo	0.529	0.529	
17		Think Bingo Game	0.679	0.679	
18	Sumatera	Crossword Puzzle	0.537	0.537	
19	Nusa Tenggara	Word Mapping	0.47	0.47	
20	Sulawesi	Jumbled Letters	0.276	0.276	
Average of Cumulative Effect Size				0.365	Large Effect

The overall distribution of research on English vocabulary learning media is shown in Table 6. The overall average effect size of articles from all regions and media indicates a large effect (0.365).

**CONCLUSION**

The Meta-analysis conducted in this study provides a comprehensive overview of the effect of various teaching media on students' English vocabulary mastery. The findings have yielded insightful findings on using innovative and interactive media, particularly those that engage students actively, such as games and multimedia applications. This aligns with the educational emphasis on student-centered learning and technology integration to enhance academic outcomes.

Films and the Duolingo application emerged as the most prevalent and effective mediums for enhancing students' English vocabulary proficiency. The Guessing Game, with an average effect size of 0.893, greatly affected students' English vocabulary mastery. This suggests that engaging and interactive media can significantly improve vocabulary mastery and be powerful teaching media.



On the other hand, the Memrise Application had the most minor effect on students' English vocabulary mastery, with an average effect size of 0.005. This indicates that not all teaching media are equally effective. These results advocate for the strategic use of technology and engaging teaching methods to support students' vocabulary mastery, which is crucial for practical communication skills in the English language.

This meta-analysis contributes valuable insights for educators, curriculum developers, and policymakers aiming to improve English vocabulary teaching strategies and outcomes in Indonesia and potentially other contexts with similar educational challenges and opportunities.

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